Management of Anxiety in Pre-Operative CABG Clients

Vinishiya Thanusayan*

Abstract

Anxiety and stress affect cardiac functions leading to the development of various heart diseases including Coronary Artery Disease (CAD) where cholesterol build-up leads to coronary artery occlusion causing angina, cardiac arrest and possible death. Coronary Artery Bypass Grafting (CABG) is a surgical procedure to treat CAD in severe cases. This study aims to employ psychological intervention to reduce anxiety in pre-operative CABG patients. A case-control study measuring anxiety levels was conducted in 30 participants. They received psychological interventions and their anxiety levels were determined by administering HAM-A rating scales pre and post assessment prior to surgery. The intervention group had better prognosis and recovery after CABG than the control group who received no psychological intervention. Reduction in anxiety pre-surgery leads to a better outcome.

1. Introduction

Anxiety is the feeling of worry, nervousness or unease about something with an uncertain outcome*. In today's world, lifestyle modifications have led to a significant increase in stress leading to various diseases including

---

* Consultant Psychologist, Zurich, Switzerland; vinishiya@icloud.com

heart disease (Zhang Yina, 2001). Stress and anxiety affect physical and psychological health. Stress caused because of acute emotional stress (Leor et al.), bad lifestyle choices (Ornish et al., 1990) like one's diet, smoking, drinking, sedentary lifestyle, and stress at workplace (Kivimaki et al., 2006) could lead to heart disease in people who had a predisposition. According to American Heart Association (AHA) more and more evidence suggests a relationship between the risk of cardiovascular disease and environmental and psychosocial factors. Kubzansky and Kawachi, strongly support the role of anxiety in the onset of coronary heart disease. While Roset et al., claim that anxiety could be an independent risk factor for coronary artery disease and cardiac mortality, high levels of anxiety after CAD constitutes a strong risk of MI or death (Shibeshi et al.). Coronary Artery Disease is one of the most serious types of cardiovascular diseases and leading cause of death and disability in all countries. In India, in over a 40 year period, CHD has increased from 4% in 1960 to 11% in 2001 (Krishnaswami, 2001).

There are different lifestyle modification strategies which could help prevent CAD. Medication is the main form of treatment. But severe cases of CAD would require surgical intervention like angioplasty and coronary artery bypass grafting. Coronary Artery Bypass Grafting (CABG) is one of the commonest major surgical operations being performed for over half a century now. In CABG, arteries or veins from other areas in the body are used to detour or bypass the narrowed coronary arteries. CABG can improve blood flow to the heart, relieve chest pain, and possibly prevent a heart attack and death.

Hospitalisation, without surgery, itself can cause anxiety, not to mention surgery. American Heart Association (AHA) estimates that as many as 30% of the patients report feeling anxious or depressed after a heart attack or heart surgery. Some evidence exists that stress management programs could reduce the risk of heart events by 75% in people with heart disease. Few psychological interventions have been known to be effective like pre-operative education leading to reduced anxiety and depression among cardiac surgery patients (Guo et al., 2012), a combination of a behavioural treatment with exercise training improving long term outcome after myocardial infarction (Dixhoorn et al., 1989) and intensive supervised relaxation

practice enhancing recovery from Ischemic cardiac event and contributing to secondary prevention (Dixhoorn & White, 2005).

Thoresen (1990) reported that psychological interventions like behavioural therapy and biofeedback in the management of CHD have shown positive effects. Mandeke (1994) adopted biofeedback and behavioural counselling in postoperative CABG patients to reduce anxiety, pain and other physical symptoms, which had positive results. Having a positive attitude on the outcome of the surgery had beneficial physical and psychological effects on CABG clients (Scheier et al.). Miller and Perry (1990) in their study employed Relaxation Technique on postoperative pain in patients undergoing cardiac surgery which was helpful in pain management. Lang et al stated that self-hypnosis, a form of deep breathing exercise, was useful in patients undergoing CABG. Studies by Singh and Kausik (1992), Kausik (1992), Sunil Dath (1993) and Sabitha (1998) have shown the effectiveness of psychobehavioural methods which included deep breathing exercises (Yoga Nidra) in helping CHD cases.

2. Methodology

The objective of the study was to find out the impact of age, the number of children and family size on the level of anxiety and the effectiveness of psychological intervention in reducing the level of anxiety in pre-operative CABG clients. A case-control study was conducted.

The hypothesis was that there will be no significant difference in the level of anxiety between pre and post-surgical intervention in CABG clients in control group compared to the experimental group and that there will be significant differences in the level of anxiety in both groups depending on the age, size of family and the number of children the client has.

This included clients diagnosed with CHD andthose undergoing CABG. The inclusion criteria were as follows: male or female, aged 35-55 belonging to any socio-economic background.

The cohort comprises 30 participants. 15 each were randomly allocated to experimental and the control arm. Their consent was

obtained and every client was consulted 7-14 days prior to the surgery. Hamilton Anxiety Rating Scale (HAM-A) was one of the first rating scales developed to measure the severity of anxiety symptoms and is still widely used in clinical and research settings. It is a 14 item scale with the total score of range of 0-56, where <17 indicated mild severity, 18-24 mild to moderate severity and 25-30 moderate to severe. The interrater reliability for this scale appears to be acceptable (Hamilton, 1959). This clinician-rated scale was used to measure the level of anxiety. The clients from the experimental group received preoperative counselling after the HAM-A was administered. They were educated about the condition they had, how CABG will improve their quality of life and it is alright to be anxious. Each client had a tailor-made counselling session. They were taught anxiety-relieving techniques, its mode of action and its effects. The clients were taught Deep Breathing and Benson's Relaxation Technique. Deep Breathing focusses on the expansion of the lungs' capacity to inhale more oxygen, done in a systematic way, helping the brain to calm down and relax. Benson's Relaxation helps to let go of all the muscular tension from toe to head, focussing and increasing the awareness of breathing, providing total tranquillity. They were asked to practice the above techniques 3-4 times/day until surgery to reduce their anxiety.

2.1 Data Analysis

The statistical procedures used in this study are

1. T-test
2. Correlation coefficient

In this study, the T-test was used to compare the experimental group with the control group and the pre and post-assessment.

The correlation coefficient was done to assess the association between age, family size, number of children and anxiety levels.

3. Results and Discussion

It is evident from Table-1 that the levels of anxiety pre and post-assessments, in the experimental groups, are significant. It proves that there is, in fact, a significant amount of anxiety reduction in the experimental group after psychological intervention, (M=13.7,

SD=5.21). This could be because the participants in the experimental group were implementing the psychological strategies which led to the reduction in anxiety levels prior to surgery.
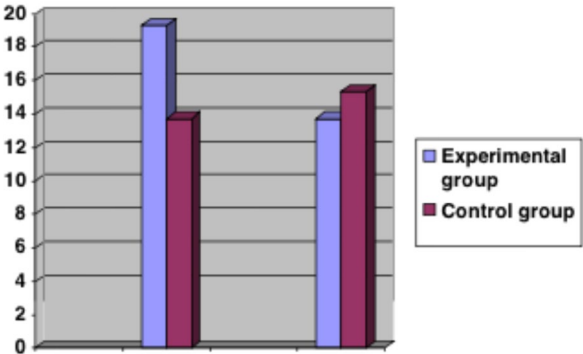
Table 1: showing levels of anxiety pre and post-assessment in the experimental group

	Size	Mean	Std. Deriv.	t-value	Significance
Pre Assessment	15	19.27	4.41	3.03	0.01
Post Assessment	15	13.73	5.21		

Table-2 shows that there was no significant change in the level of anxiety in the control group between pre and post-surgical assessments (M-15.33, SD = 2.64). The control group was not offered any psychological interventions to control their anxiety. It appears that the client's anxiety was worse prior to the surgery.

Table 2: Showing Levels of Anxiety Pre and Post-Assessment in Control Group

	Size	Mean	Std. Deriv.	t-value	Significance
Pre Assessment	15	13.73	2.56	1.62	Not Significant
Post Assessment	15	15.33	2.64		

Graph 1- showing the pre and post levels of anxiety in both the groups

Graph-1 compares the levels of anxiety in both the groups, pre and post-intervention. There is a significant reduction in the level of anxiety in the experimental group after the intervention. Fumin et al.'s study showed that pre-operative psychological intervention had effectively improved the psychological status of patients undergoing CABG and had helped post-operative recovery and quality of life which was similar to how it was expected and hypothesised in the current study. The absence of similar reduction of anxiety in the control group, without any intervention, confirms that they have no benefit. It is obvious that psychological intervention has positively benefited the CABG clients in the experimental group while the control group worsened thereby accepting Hypothesis 1 and 2.

Table 3: Showing Correlation between Age, Family Size, Number of Children and Anxiety in Both Groups

	Correlation coefficient	Significance
Between age and anxiety in the pre-level	-0.282	NS
Between the family size and anxiety in the pre-level	-0.164	NS
Between the number of children and anxiety in the pre-level	-0.015	NS

Krannich et al. (2007) in their study found a negative correlation between age and anxiety in CABG patients. They found younger patients were more anxious than elderly clients. It could possibly be that the younger they were, the more responsibility they had and also could be the fear of adverse outcomes or death. In contrast, this study showed that both the groups had anxiety regardless of their age (-0.282) and there was no correlation between the age of the patient undergoing CABG and anxiety. Also, the current study only employed working, actively productive people aged 35 to 55 and not the elderly. Before the study was conducted, it was believed that the larger the family, the more care and support a patient would get which could possibly help with their anxiety. However, unfortunately, there are no relevant studies to back it up or deny it. The family size (-0.164) of the CABG clients and anxiety had no correlation in this study. It was also believed that the more children one has, the more responsibility it was. This, in turn, could evoke

anxiety in the clients about to undergo CABG. But the number of children (-0.015) and anxiety were not correlated.

Table-3 shows that there is no correlation between the age, family size and number of children of the client undergoing CABG and anxiety. There could be various other factors that could influence the level of anxiety in a CABG client. Thus, the hypothesis thatthere will be significant differences in the level of anxiety in both groups depending on the age, size of family and the number of children the client has, is rejected.

The comparison between pre and post level scores on each symptom for the experimental group shows how anxious mood, depressed mood, muscular symptoms and genito-urinary symptoms reacted significantly favourable to the intervention. In all other symptoms, only a cumulative impact rather than an individual reaction was evident. The comparison between pre and post level scores on each symptom for the control group shows depressed mood with muscular levels goingdown while the other symptoms remain at insignificant levels. While contrasted with the experimental group, the control group suffer.

4. Limitations

The following limitations were identified. The sample size was small. The time period was short, because of the acute nature of the heart condition. As the clients were all out-patients and because of their physical condition, they were unable to make visits on a continuous basis. Hence, they were educated about the correct technique and it was ensured that they had learnt it properly. The caregivers of the clients were informed about the benefits of the intervention and the clients were enlightened about repeated performances. Their regular practising, though not monitored by the investigator, was monitored by the caregiver at home.

4.1 Suggestions for Future Research

The study could be done on a bigger population. The intervention could be given for a longer period. The effectiveness of other psychological interventions could also be administered.

5. Conclusion

Stress and anxiety are thought to affect the outcome of the surgery and this study demonstrates that a reduction in anxiety levels can be achieved by using a few simple and effective psychological interventions like deep breathing and relaxation technique in clients prior to CABG.

References

Benson, H., Beary, J,F, & Carol, M.P. (1974). The relaxation response. *Psychiatry 1974, 37, 37-45.*

Coping With Feelings. (2007, 2008). *American Heart.org. and American Heart Association.* Cited at http://www.americanheart.org/presenter.jhtml?identifier=3047697

Dath, S. (1993). Behavioral intervention in coronary heart disease. Unpublished M.Phil. *Dissertation submitted to NIMHANS, Bangalore University, Bangalore, India.*

Dembroski, M. (1989). Components of hostility as predictors of sudden death and myocardial infarction in multiple risk factor intervention trial; *Psychosomatic Medicine, 51,* 514-522.

Dehdari, T., Heidarnia, A., Ramezankhani, A., Sadeghian, S., & Ghofranipour, F. (2009). Effects of progressive muscular relaxation training on quality of life in anxious patients after coronary artery bypass graft surgery. *Indian Journal of Medical Research, 129,* 603-608.

Dixhoorn, J., Duivenvoorden, J., Staal, A., & Pool, J. (1989). Physical training and relaxation therapy in cardiac rehabilitation assessed through a composite criterion for training outcome. *American Heart Journal,* 118, 545–552.

Dixhoorn, J., & White, A. (2005). Relaxation therapy for rehabilitation and prevention in ischaemic heart disease: a systematic review and meta-analysis. *European Journal of Cardiovascular Prevention & Rehabilitation, 12,* 193-202.

Fumin, P., Ran W., Aimin, Z., Jiyue, S., Jinghong, M., & Jin, A. (2017). The effect of perioperative psychological intervention on psychological and quality of life in patients with coronary heart disease after CABG. *Biomedical Research*, Special Issue, S713-S719.

Guo, P., East, L., & Arthur, A.(2012). A preoperative education intervention to reduce anxiety and improve recovery among Chinese cardiac patients: A randomized controlled trial. *International Journal of Nursing Studies, 49*(2), 129-137.

Hamilton, M. (1959). The assessment of anxiety states by rating. *British Journal of Medical psychology*, 32, 50-55.

Hattan, J., et al., (2002). The impact of foot massage and guided relaxation following cardiac surgery: a randomized controlled trial. *Journal of Advanced Nursing, 37*(2), 199-207.

Kawachi, I., Sparrow, D., Vokonas, P. S., & Weiss, S. T. (1994). Symptoms of anxiety and risk of coronary heart disease. The Normative Aging Study. *Circulation*, *90*(5), 2225-2229.

Kivimäki, M., Virtanen, M., Elovainio, M., Kouvonen, A., Väänänen, A., & Vahtera, J. (2006). Work stress in the etiology of coronary heart disease- a meta-analysis. *Scandinavian Journal of Work, Environment & Health, 32*(6), 431-442.

Kovacs, A., Saidi, A., Kuhl, E., Sears, S., Silversides, C., Harrison, J., Ong, L., Colman, J., Oechslin, E., & Nolan R. (2009). Depression and anxiety in adult congenital heart disease: Predictors and prevalence. *International Journal of Cardiology, 137*(2), 158-164.

Krannich, J.H., Weyers, P., Lueger, S., Herzog, M., Bohrer, T., & Elert, O. (2007). Presence of depression and anxiety before and after coronary artery bypass graft surgery and their relationship to age. *BMC Psychiatry, 7*(47). doi:10.1186/1471-244X-7-47

Krishnaswami, S. (2002). Prevalence of Coronary artery disease in India. *Indian Heart Journal, 54, 103*.

Kubzansky, D., & Kawachi, I. (2000). Going to the heart of the matter. Do negative emotions cause coronary heart disease? *Journal of Psychosomatic Research, 48,* 323- 337.

Lane J., White A., Williams R. (1984). Cardiovascular Effects of Mental Arithmetic in Type A and Type B Female. *Society for Psychophysiological Research, 21(*1), 39-46.

Leor, J., Poole, W. K., & Kloner, R. A. (1996). Sudden cardiac death triggered by an earthquake. *New England Journal of Medicine*, *334*(7), 413-419.

Mandke, R. (1994). Behavioral intervention in post-operative coronary heart disease patients. Unpublished M. Phil. dissertation, submitted to NIMHANS, Bangalore, India.

Miller, M., & Perry, A. (1990). Relaxation technique and postoperative pain in patients undergoing cardiac surgery. *Heart and Lung: The Journal of Critical Care, 19*(2), 136-46.

Ornish, D. (1990). *Dr. Dean Ornish's program for reversing heart disease*. New York: Ballantine Books.

Roest A., Martens E., Jonge P., & Denollet J. (2010). Anxiety and Risk of Incident Coronary Heart Disease, A Meta-Analysis. *Journal of the American College of Cardiology, 56*(1).

Sabita, R. (1998). Cognitive behavioral intervention in myocardial infarction. Ph.D. thesis submitted to NIMHANS, Bangalore, India.

Sarvotham, G., & Berry, N. (1968). Prevalence of coronary heart disease in an urban population in Northern India. *Circulation, 37*, 939-952.

Schnall L., Landsbergis A., & Baker D. (1994). Job strain and cardiovascular disease. *Annual Review Public Health, 15*, 381-411.

Scheier, M. F., Matthews, K. A., Owens, J. F., Magovern, G. J., Lefebvre, R. C., Abbott, R. A., & Carver, C. S. (1989). Dispositional optimism and recovery from coronary artery bypass surgery: The beneficial effects on physical and psychological well-being. *Journal of Personality and Social Psychology, 57(6)*, 1024-1040.

Shibeshi, W., Young-Xu,Y., & Blatt, C. (2007). Anxiety Worsens Prognosis in Patients With Coronary Artery Disease. *Journal of the American College of Cardiology, 49*(20).

Singh, K., & Kausik S. (1992). Chronic psychological stressors and stressful life change events among case and control group patients of CHD. Presented at the VI National Annual Conference of Behavioral Medicine Society of India, held at NIMHANS, Bangalore, 28-29.

Surwitt, S., Williams, B., & Shapiro, D. (1982). *Behavioral approaches to cardiovascular disease.* Academic Press: New York.

Thoresen, C.E. (1990). The recurrent coronary prevention project. Findings at 8 1⁄2 years.*Invited paper, First International congress of behavioral medicine, Uppsala, Sweden.*

Zhang, Y. (2001). Bad lifestyle habits threaten people's health. *Xinhua news agency*. Cited at www.china.org.cn/english/SO-e/22025.html